

In the claims:

1. (Currently Amended) An optical isolator core comprising:

A first polarizer having a wedge shape and configured to receive incident light traveling along a path and refract the incident light into o-rays and e-rays;

a rotator disposed along the path and configured to rotate the polarization planes of the o-rays and e-rays;

~~a second polarizer having a wedge shape and disposed along the path and between the first polarizer and the rotator, the second polarizer~~ having an optic axis approximately 45° apart from an <sup>optical</sup> ~~optical~~ axis of the first polarizer; and

a correction element of birefringent material, disposed along the path and adjacent to a diagonal face of the second polarizer, having a length and an optic axis angle, wherein the length and the correction element optic axis angle are chosen to compensate for differential group delay and walk-off introduced by the first and the second polarizers, wherein the correction element includes an optical plane in which said o-rays and said e-rays travel, wherein said optical plane is perpendicular to said optic axis of said second polarizer, and an input face of the correction element being parallel to an input face of the second polarizer such that the optical plane of the correction element is perpendicular to the optic axis of second polarizer.

2. (Original) The isolator core of claim 1, wherein said first and said second polarizers each have approximately the same wedge angle.

3. (Original) The isolator core of claim 2, wherein said first polarizer has an optic angle of approximately <sup>+45° or -45°</sup> ~~+/45°~~.

4. (Original) The isolator core of claim 3, wherein said second polarizer has an optic angle of approximately 0° or 90°.

5. (Previously amended) The optical isolator of claim 1, wherein a distance traveled by said o-rays and the e-rays through said correction element is equal to the length of the correction element multiplied by the tangent of the angle  $\beta$ .

6. (Cancelled)

7. (Original) The optical isolator of claim 1, wherein said correction element comprises a single piece of material.

8. (Original) The optical isolator of claim 1, wherein said correction element is configured such that said e- and o-rays are refracted such that said e- and o- rays intersect at a point proximate to a distal face of said correction element.

8. (Currently Amended) An optical isolator adapted for receiving light transmitted through the isolator in a forward direction comprising:

a first polarizer having a wedge shape, disposed along a path, configured to separate light incident in the forward direction into at least one o-ray and at least one e-ray;

a polarization rotator disposed along the path;

a second polarizer having a wedge shape and disposed along the path and between  
the first polarizer and the polarization rotator; and

a correction element, disposed along the path and adjacent to a diagonal face of  
the second polarizer, having a length and a crystal optic axis which lies in a plane defined by the at least one e-ray and the at least one o-ray, wherein the length and the crystal  
optic axis angle compensates for differential group delay and walk-off introduced by the  
first and the second polarizers, wherein the correction element includes an optical plane  
in which said o-rays and said e-rays travel, and

wherein said optical plane is perpendicular to said optic axis of said second  
polarizer, and an input face of the correction element being parallel to an input face of the

second polarizer such that the optical plane of the correction element is perpendicular to the optic axis of the second polarizer.

~~10.~~ (Original) The optical isolator of claim ~~8~~ wherein said at least one o-ray and said at least one e-ray travel through said isolator separated by a walk-off distance and said correction element is configured to substantially eliminate said walk-off distance between said at least one o-ray and said e-ray exiting said second polarizer.

~~11.~~ (Original) The optical isolator of claim ~~9~~ wherein said correction element is configured to substantially eliminate differential group delay.

~~12.~~ (Original) The optical isolator of claim ~~8~~ wherein said first polarizer has a crystal optic axis angle of approximately  $\pm 45^\circ$ .

~~13.~~ (Original) The optical isolator of claim ~~8~~ wherein said second polarizer has a crystal optic axis angle of approximately  $0^\circ$  or  $90^\circ$ .

~~14.~~ (Original) The optical isolator of claim ~~13~~ wherein said correction element has a crystal optic axis  $\alpha$  which lies with the plane defined by said at least one o-ray and said at least one e-ray.

~~15.~~ (Original) The optical isolator of claim ~~8~~ wherein said correction element has a length  $L$  and a crystal optic axis angle  $\alpha$  which are selected such that said at least one e-ray is refracted by said correction element such that the respective light paths of said e- and o-rays intersect at a location proximate to a face of said correction element.

~~16.~~ (Original) The optical isolator of claim ~~15~~ wherein said o-rays and said e-rays are refracted by said correction element.

16  
17. (Original) The optical isolator of claim 15 wherein said at least one o-ray and said at least one e-ray intersect at an angle  $\beta$ .

18  
17. (Original) The optical isolator of claim 15 wherein said at least one o-ray and said at least one e-ray exit said second polarizer separated by a walk-off distance which is approximately equal to said length L of the correction element multiplied by the tangent of angle  $\beta$ .

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18. (Original) The optical isolator of claim 18 wherein said tangent of angle  $\beta$  is defined as:

$$\tan(\beta) = \frac{(n_e^2 - n_o^2) \sin(\alpha) \cos(\alpha)}{n_o^2 \sin^2 \alpha + n_e^2 \cos^2 \alpha}$$

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19. (Original) The optical isolator of claim 9, wherein said first and second polarizers comprise birefringent material.

21  
20. (Original) The optical isolator of claim 9, wherein said first polarizer, said polarization rotator, said second polarizer, and said correction element are arranged in a sequence along an axis of said isolator.

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21. (Currently Amended) An optical isolator adapted for receiving light transmitted through the isolator in a forward direction comprising:

a first polarizer, having a wedge shape and disposed along a path, configured to separate light incident in the forward direction into at least one o-ray and at least one e-ray;

a polarization rotator disposed along the path;

C a second polarizer, having a wedge shape and disposed along the path and  
C after between the first polarizer and the polarization rotator, configured to refract the at least one o-ray and at least one e-ray such that they exit said second polarizer in substantially parallel light paths separated by a walk-off distance; and

a correction element, disposed along the path and adjacent to a diagonal face of the second polarizer, having a length and a crystal optic axis which lies in a plane defined by the at least one o-ray and at least one e-ray, and wherein at least one of the at least one o-ray and at least one e-ray exiting the second polarizer are refracted by the correction element such that their respective light paths intersect at an angle  $\beta$ , and wherein the length and the crystal optic axis angle compensates for differential group delay and walk-off introduced by the first and the second polarizers wherein the correction element includes an optical plane in which said o-rays and said e-rays travel, and

*C* wherein said optical plane is perpendicular to said optic axis of said second polarizer, and an input face of the correction element being parallel to an input face of the second polarizer such that the optical plane of the correction element is perpendicular to the optic axis of the second polarizer.

*22*  
~~23~~ (Original) The optical isolator of claim ~~22~~ *21* wherein said correction element is configured to substantially eliminate said walk-off distance between said at least one o-ray and at least one e-ray exiting said second polarizer.

*23*  
~~24~~ (Original) The optical isolator of claim ~~22~~ *21* wherein said correction element is configured to substantially eliminate differential group delay.

*24*  
~~25~~ (Previously amended) The optical isolator of claim ~~22~~ *21* wherein said first polarizer has a crystal optic axis angle of approximately  $+45^\circ$  or  $-45^\circ$  relative to a vertical edge of the first polarizer.

*25*  
~~26~~ (Previously amended) The optical isolator of claim ~~22~~ *21* wherein said second polarizer has a crystal optic axis angle of approximately  $0^\circ$  or  $90^\circ$  relative to a vertical edge of the second polarizer.

*26*  
~~27~~ (Original) The optical isolator of claim ~~22~~ *21* wherein said polarization rotator comprises a  $45^\circ$  Faraday rotator.

~~27~~ (Original) The optical isolator of claim ~~21~~ wherein said correction element has a length L and a crystal optic axis cutting angle  $\alpha$  which are selected such that said at least one o-ray or said at least one e-ray are refracted by said correction element such that their respective light paths intersect at a location proximate to a face of said correction element.

~~28~~ (Original) The optical isolator of claim ~~21~~ wherein both of said at least one o-ray or said at least one e-ray are refracted by said correction element.

~~29~~ (Original) The optical isolator of claim ~~21~~ wherein said at least one o-ray and said at least one e-ray intersect at an angle  $\beta$ .

~~30~~ (Original) The optical isolator of claim ~~21~~ wherein said at least one o-ray and said at least one e-ray exit said second polarizer separated by a walk-off distance which is approximately equal to said length L multiplied by the tangent of angle  $\beta$ .

~~31~~ (Original) The optical isolator of claim ~~21~~ wherein said tangent of angle  $\beta$  is defined as:

$$\tan(\beta) = \frac{(n_e^2 - n_o^2) \sin(\alpha) \cos(\alpha)}{n_o^2 \sin^2 \alpha + n_e^2 \cos^2 \alpha}$$

~~32~~ (Original) The optical isolator of claim ~~21~~, wherein said first and second polarizers comprise birefringent material.

~~33~~ (Original) The optical isolator of claim ~~21~~, wherein said first polarizer, said polarization rotator, said second polarizer, and said correction element are arranged in a sequence along an axis of said isolator.

~~35~~<sup>34</sup> (Currently amended) A method for receiving light passing through an optical isolator in a forward direction through the isolator comprising:

providing a first polarizer, having a wedge shape and disposed along a path, configured to separate light incident in the forward direction into at least one o-ray and at least one e-ray;

providing a polarization rotator disposed along the path;

~~after~~<sup>35</sup> providing a second polarizer, having a wedge shape and disposed along the path and between the first polarizer and the polarization rotator, configured to refract the at least one o-ray and at least one e-ray such that they exit said second polarizer in substantially parallel light paths separated by a walk-off distance; and

providing a correction element, disposed along the path and adjacent to a diagonal face of the second polarizer,

separating the light traveling in a forward direction into at least one o-ray and at least one e-ray;

rotating the polarization of the at least one o-ray and the at least one e-ray;

refracting the at least one o-ray and the at least one e-ray such that they are in substantially parallel paths; and

passing the at least one o-ray and the at least one e-ray through a the correction element having an optic axis in a plane defined by the substantially parallel paths and a length ~~which~~ <sup>which</sup> compensates for differential group delay and walk-off introduced by the separating and the refracting, wherein the correction element includes an optical plane in which said o-rays and said e-rays travel, wherein said optical plane is perpendicular to an optic axis of said second polarizer, and an input face of the correction element being parallel to an input face of the second polarizer such that the optical plane of the correction element is perpendicular to the optic axis of the second polarizer.

~~35~~<sup>34</sup> ~~36~~ (Original) The method of claim ~~35~~<sup>34</sup> wherein said correction element is configured to substantially eliminate said walk-off distance between said at least one o-ray and at least one e-ray exiting said second polarizer.

*36*  
*37* (Previously amended) The method of claim ~~35~~ wherein said correction element is configured to substantially eliminate ~~the~~ first order polarization mode dispersion.

*34*  
38. (Original) The method of claim ~~35~~ wherein said correction element has a length L and a crystal optic axis cutting angle  $\alpha$  which are selected such that said at least one o-ray and said at least one e-ray are refracted by said correction element such that their respective light paths intersect at a location proximate to a face of said correction element.

39. (Original) The method of claim 38 wherein said at least one o-ray and said at least one e-ray exit separated by a walk-off distance which is approximately equal to said length L multiplied by the tangent of angle  $\beta$ .

40. (Original) The method of claim 39 wherein said tangent of angle  $\beta$  is defined as:

$$\tan(\beta) = \frac{(n_e^2 - n_o^2)\sin(\alpha)\cos(\alpha)}{n_o^2 \sin^2 \alpha + n_e^2 \cos^2 \alpha}$$

41. (Currently amended) An optical isolator comprising:  
*38* means for separating light traveling in a forward direction disposed along a path into at least one o-ray and at least one e-ray;

means for rotating the polarization of the at least one o-ray and the at least one e-ray;

*39* means for refracting the at least one o-ray and the at least one e-ray, disposed along the path, such that they are in substantially parallel paths, wherein the means for refracting is disposed <sup>after</sup> between the means for separating light and the means for rotating; and

means for passing the at least one o-ray and the at least one e-ray, disposed along the path, through a correction element having an optic axis in a plane defined by the

substantially parallel paths and a length chosen to compensate for differential group delay and walk-off introduced by the separating and the refracting, wherein the means for passing is disposed adjacent to the means for refracting, and wherein said optical plane is perpendicular to an optic axis of said means for refracting, and an input face of the correction element being parallel to an input face of the means for refracting such that the optical plane of the correction element is perpendicular to the optic axis of the means for refracting.

42. (Original) The optical isolator of claim 41 wherein said correction element is configured to substantially eliminate said walk-off distance between said at least one o-ray and at least one e-ray exiting said optical isolator second polarizer.

43. (Previously amended) The method of claim 41 wherein said correction element is configured to substantially eliminate the first order polarization mode dispersion.

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44. (Original) The optical isolator of claim 41 wherein said correction element has a length L and a crystal optic axis cutting angle  $\alpha$  which are selected such that said at least one o-ray and said at least one e-ray are refracted by said correction element such that their respective light paths intersect at a location proximate to a face of said correction element.

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45. (Original) The optical isolator of claim 44 wherein said at least one o-ray and said at least one e-ray exit separated by a walk-off distance which is approximately equal to said length L multiplied by the tangent of angle  $\beta$ .

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46. (Original) The optical isolator of claim 45 wherein said tangent of angle  $\beta$  is defined as:

$$\tan(\beta) = \frac{(n_e^2 - n_o^2) \sin(\alpha) \cos(\alpha)}{n_o^2 \sin^2 \alpha + n_e^2 \cos^2 \alpha}$$

~~41~~<sup>37</sup> (Previously added) The method of claim ~~37~~<sup>36</sup> wherein the first order polarization mode dispersion is a differential group delay.

~~48~~<sup>44</sup> (Previously added) The method of claim ~~43~~<sup>44</sup> wherein the first order polarization mode dispersion is a differential group delay.